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What Influences Clinicians' Decisions about ADHD Medication? Initial data from the Influences on Prescribing for ADHD Questionnaire (IPAQ)

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Abstract

Despite evidence for its efficacy and effectiveness, the use of medication for the treatment of ADHD remains controversial. Little is known about the factors that influence clinicians' decisions to use medication for ADHD. Here we present initial data on the attitudes of prescribing clinicians from the Influences on *Prescribing for ADHD Questionnaire (IPAQ)* – a new clinician-completed, 40-item scale. The eight IPAQ subscales cover attitudes towards; (i) treatment outcome *optimisation*, (ii) the use of *rule based over more informal approaches*, (iii) *side effects*, (iv) *symptoms control as the primary goal of treatment*, (v) *the influence of external pressure on medication related decisions*, (vi) *the value of taking the child's views into account*, (vii) *long term medication use* and (viii) the value of *psychosocial approaches for the treatment of ADHD*. Sixty-eight clinicians from Belgium and the UK took part. All subscales had acceptable levels of internal reliability (Chronbach's alpha = 0.62–0.78). Overall, clinicians reported taking a rule-based approach to prescribing with a focus on treatment optimisation, taking the child's view into account and valuing psycho-social approaches. They focused on treating broader patterns of impairment, but were wary of the potential side effects and long-term treatment. Psychiatrists scored high on their focus on symptom control and preference for long-term medication use, while paediatricians reported using more rule-based approaches. We identified four distinctive response profiles: (i) pro-psychosocial; (ii) medication focused; (iii) unsystematic; and (iv) response optimizers. Future larger scale studies are required to replicate these profiles and to explore their relationship with prescribing behaviour and treatment outcomes.

Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is an early onset and debilitating mental health condition, which can persist across the life span [1]. At its core, is a persistent and pervasive pattern of inattention and/or hyperactivity and impulsiveness. It often overlaps with other conditions (e.g., oppositional defiant disorder, conduct disorder, anxiety, and reading problems [2, 3] and causes significant impairment across multiple functional domains [4]. Children with ADHD are more likely to fail at school and to go on to be unemployed [5, 6], to be involved in crime [7], to use illegal substances [1] and to suffer from other comorbid mental health problems[8]. Moreover, ADHD also significantly impacts on patients' families leading to disrupted parental marriages and parent-child relationships, as well as increased levels of parental stress [9]. The condition also affects communities and is associated with substantial economic and health care burden [10, 11]. Accordingly, effective management of ADHD is a major health policy goal across nations.

While behavioural interventions are recommended as first-line treatment in very young or less severe cases, multi-modal approaches combining pharmacological and non-pharmacological therapies are generally advised by clinical guidelines for the treatment of ADHD [12-16]. Evidence from randomised controlled trials supports stimulant medications such as methylphenidate and amphetamines [17-19] as well as non-stimulants such as atomoxetine, clonidine extended-release (ER) and guanfacine extended-release (ER), as efficacious medical treatments for ADHD [20-24]. These treatments reduce the level of core ADHD symptoms giving a good short-term clinical response in between 70 and 80 percent of patients [18, 25]. Building on this evidence base, clinical guidelines have made recommendations about the initiation, continuation, switching or stopping of medications for ADHD [12-16, 26].

Despite the empirical evidence and published guidelines which highlight the value of medication for the treatment of individuals with ADHD, ultimately, the decision to use medication remains with the clinician. In making treatment decisions, the clinician has to weigh-up different (and sometimes competing) formal (e.g., medical guidelines) and informal (parents, teachers, patients) sources of information, influences and priorities when determining whether, when and how to initiate medication, whether to alter the medication regime during treatment, and finally, when to stop medication. We have recently completed a series of semi-structured interviews with child psychiatrists, and paediatricians (in Belgium and England) exploring the range of factors that might influence diagnostic and treatment-related decisions [27]. On the basis of these findings we identified a number of factors likely to influence treatment and medication practice in relation to ADHD. These form the basis for a new questionnaire – the *Influences on Prescribing for ADHD Questionnaire* (IPAQ) (for a full description, see Methods section).

In the current paper we examine the reliability of the IPAQ subscales; explore the relationship between IPAQ scores and clinicians' background and characteristics – including their gender, age, experience with ADHD, professional affiliation and their country of work (England or Belgium); and generate an initial set of clinician profiles relating specifically to attitudes towards prescribing medication for children with ADHD.

Method

Measure

The IPAQ was developed on the basis of the key themes derived from qualitative analysis of semi-structured interview data carried out in the Decisions Regarding ADHD Management (DRAMa) study [27]. The DRAMa study focused on the uncertainties and complexities in assessment, diagnosis and treatment of ADHD from the clinician's point of view (for more detailed information and results, please refer to Kovshoff et al [27]. On the

basis of inductive thematic analysis of 50 interviews with consultant psychiatrists and paediatricians, ten themes were identified that related to medication-related decision making. For the purpose of designing the questionnaire, these qualitative data were supplemented by a review of current evidence-based ADHD guidelines [12-16, 28]. Initially 70 items were generated, covering ten themes in relation to treatment initiation, treatment switching and treatment termination. All of the items were rated on a likert scale of 0 (not at all important) to 6 (extremely important) and a separate score was generated for each subscale.

The original 70 item clinician-completed questionnaire was analysed to ensure that all subscales had adequate internal consistency. Following, the measure was reduced to a 40-item scale with eight subscales and five items making up each subscale. These cover attitudes in relation to; (i) treatment outcome *optimisation*, (ii) the use of *rule based over more informal approaches*, (iii) *side effects*, (iv) *symptoms control as the primary goal of treatment*, (v) *the influence of external pressure on medication-related decisions*, (vi) *the value of taking the child's views into account*, (vii) *lon- term medication use* and (viii) the value of *psychosocial approaches for the treatment of ADHD*.

(i) Attitudes to optimising outcomes measures the extent to which prescribing clinicians are motivated to achieve as much symptom reduction and functional improvement as they can, or whether they are satisfied with a sufficient "degree of improvement" that may nevertheless be suboptimal.

(ii) Rule based approach focuses on issues relating to the more general clinical style of the respondent**.** It measures how closely clinicians follow clinical guidelines and their recommendations for prescribing medication to make their

treatment decisions or whether they employ a more flexible, individualized, and experience based approach.

(iii) Tolerance of side effects assesses clinicians' sensitivity to the types of adverse events typically associated with ADHD medications [31-35].

(iv) Focus on symptoms: This covers two elements; first the focus on symptoms as opposed to impairment and second, the focus on symptoms as opposed to underlying causes. While the diagnosis of ADHD requires both symptom and impairment criteria to be met, it remains unclear how focused clinicians are on symptom reduction as opposed to improvements of daily functioning when judging the effectiveness of medication. With regards to the causal nature of ADHD, the phenomenological approach that underpins ADHD diagnosis in current systems makes no reference to underlying reasons for the behaviour (i.e., genetics, environment or neurobiology). However, the finding from Kovshoff et al [27] highlighted that clinicians differentiated between biological ADHD, where there was apparent neurobiological dysfunction and family heritability, and non-biological ADHD which they judged as being due to environmental factors.

(*v) Influence of external pressure* subscale measures the role of external influences on decision making. In some situations, parents or teachers may place clinicians under pressure to make a diagnosis and treat a child, even when the clinician believes treatment is unnecessary. Alternatively, clinicians may be convinced of the need for medication, but not always try to persuade parents who may be reluctant to medicate their child. They may also be impervious to external pressure to prescribe in cases where they do not believe it would be beneficial for the child.

(vi) Importance of the child's views. As the need for medication is primarily determined by adults, little is known about the extent to which the views of children

are taken into account when making treatment decisions. The items in this subscale focus on whether the child's views are perceived to influence prescribing practice, and the extent to which these views may be overridden by those of the adults.

(vii) Long-term use of medication. Some models of ADHD highlight its status as a lifelong condition that requires long-term use of medication for its effective treatment. Alongside these, a number of concerns have been raised in the literature about the potential long-term chronic use of stimulants [29] not least in relation to brain development [30-32]. Unfortunately, there are little or no data from long term RCTs that would allow the evaluation of these claims and clinicians are left to manage this uncertainty without an evidence base to guide them. Using this subscale we attempted to quantify clinicians' willingness to use medication long term.

(viii) Importance of psychosocial treatments: Published guidelines recommend the use of psychosocial interventions prior to medication trials. Moreover, many parents and clinicians are often hesitant about using medication and look for effective alternatives to medication for the treatment of ADHD. Thus, the extent to which clinicians value psychosocial treatments relative to medication as an effective treatment for ADHD was judged likely to be an important factor in determining clinicians' decision to use medication.

Table 1 about here

Multiple items were designed to cover each theme/subscale. In each putative subscale ambiguity and overlap were avoided as far as possible. For the Flemish version of the IPAQ, items were translated from English to Dutch and back-translated following standard procedures.

Procedure

Participant Recruitment. In the South of England, participants were originally recruited for a linked study (Kovshoff et al [27]– see Measures section for a description) via email through the complete child psychiatrist (n = 79) and paediatrician (n = 49) practice register list for the region. Twenty-two (13 psychiatrists and 9 paediatricians) opted to participate in the first phase of the project and all 22 were re-contacted and asked to participate in the present research. Additional participants were also recruited through approaching professional groups of clinicians specialising in ADHD. In Belgium, participants were originally recruited for the same linked study listed above via the complete child psychiatrist (n = 187) and paediatrician (paediatricians: n = 758, child neurologists: n= 35) practice register list. Of these clinicians, 149 were randomly selected via an internet-based randomization procedure and invited to participate in the interview study. Thirty (15 psychiatrists and 15 paediatricians) of 149 opted to participate in the first phase of the project and 29 of 30 also participated in the present research. Additional participants (n = 18, of which 8 child psychiatrists and 10 paediatricians) were also randomly recruited via the same child psychiatrist and paediatrician practice register list. Clinicians were sent the IPAQ along with a participant information sheet, consent form, and stamped addressed envelope to return the questionnaire.

Data analysis

Cronbach's alpha coefficients were computed to assess the internal consistency of each IPAQ subscale. On the basis of the internal consistency analysis (Cronbach's alphas were calculated for each domain and the scale overall), 30 individual items and two themes were dropped. The final questionnaire data that were used for the remaining analyses reported in the current paper consist of responses to questions grouped into eight themes/subscales consisting of five items per subscale for a total of 40 items (see Table 1).

Means and standard deviations for each of the eight final subscales were computed, and Pearson correlation coefficients were employed to assess the correlation values between individual subscales. Additionally, Pearson correlation coefficients and t-tests were computed to explore the associations between the IPAQ subscale scores and clinician characteristics including gender, country of practice (UK or Belgium), clinician type (psychiatrist or paediatrician/child neurologist), total years practicing medicine, and total years practicing as a consultant specialising in ADHD. Finally, K-means cluster analysis was used to determine the best fit cluster solution amongst the data.

Results

Participant characteristics. A total of 68 participants returned completed IPAQ questionnaires including 47 participants from Flanders, Belgium and 21 from the South of England. The sample included 34 child psychiatrists and 34 paediatricians/child neurologists. Forty participants were female. The average number of years since qualification as a medical practitioner for the entire group was 17.34 (*SD* = 10.47; 15.23 (*SD* = 9.28) for psychiatrists and 20.50 (*SD* = 11.59) for paediatricians). The mean number of years of experience working at consultant level with children with ADHD for the full sample was 14.95 (*SD* = 12.65); 10.10 (*SD* = 9.18) for psychiatrists and 20.09 (*SD* = 14.95) for paediatricians). There was a significant group difference for number of years working in a senior consultant role, with paediatricians having worked more years in the field $t(64) = -3.47$, $p = .001$. There were no significant between-group differences for total number of years in medical practice.

Internal consistency. Cronbach alpha coefficients on the final eight subscales are shown in Table 1. These ranged from .62 to .78, indicating acceptable levels of internal

consistency and reliability. The reliability of sub-scales was not improved by removing individual specific items.

Table 2 about here

Descriptive statistics. Subscale mean scores ranged from 0 to 30 (see table 2). The subscale with the highest mean score was *rule based approach* (*M* = 22.22, *SD* 4.82), indicating that the majority of clinicians regarded following guidelines and regulations with regards to medicating patients of importance to their practice. This includes ensuring patients had a confirmed diagnoses and carefully checking for contra-indications before prescribing. Clinicians also reported that *optimising outcomes* was an important treatment aim, rather than being satisfied with some improvement (*M* = 19; *SD* = 4.74). The *importance of children's' view*s was regarded as significantly guiding their decisions (*M* = 18.08, *SD* = 4.12) and *psychosocial treatments* were seen as an important first step in treatment (*M* = 16.85, *SD* = 5.36). The lowest mean score was found for the *focus on symptoms* subscale (*M* = 8.84; *SD* = 4.12). This suggests that clinicians are more concerned with levels of impairment and/or the causes of the patient's ADHD behaviour than symptoms. A low score was also seen for *tolerance of side effects* (*M* = 10.85, *SD* = 4.82), which suggests that clinicians are in general concerned about side-effects and these exert an influence on their prescribing behaviours. External pressure from parents or teachers is not regarded as having a strong influence by clinicians on their practice (*M* = 11.85, *SD* = 4.75) and clinicians are predominantly in favour of stopping treatment as soon as it seems feasible, rather than treating ADHD with medication over the long term (*M* = 13.15, *SD* = 5.15).

Table 3 about here

Subscale inter-correlations. Pearson correlation coefficients indicated that six of the eight subscales were significantly correlated with other subscales. Significant correlations ranged from r = .29 to r =.44 and included positive associations between *rule based approaches* and *importance of psychosocial treatments* (r = .29, p = .016); *and tolerance of side effects* and *long term use of medication* (r = .39, p = .001). Negative associations were found between the *rule based approaches* subscale and the *tolerance of side effects* (r = -.40, p = .001) and *influence of external pressure* (r = -.44; p <.001) subscales. Negative correlations were also found between *importance of psychosocial interventions and tolerance of side effects* (r = -.30; p <.012), *focus on symptoms* (r = -.29; p <.018), *and long term use of medication* (r = -.37; p =.002) subscales. The *attitudes towards optimising outcomes* and *importance of the child's views* subscales were not correlated with other subscales.

Relationships between IPAQ subscales and clinician characteristics. There was a significant gender effect on the *attitudes to optimising treatment* subscale score with female clinicians reporting more positive attitudes to optimising than male clinicians t(66) = -2.60, p = .011. There was also an effect of country of practice and the *rule based approach* and *influence of external pressure* subscales. Belgian participants used more *rule based approaches* t(66) = -3.17, p = .002 and showed a trend towards higher scores on the *attitudes to optimising* subscale t(66) = -1.98, p = .052. UK participants were more influenced by external pressure t(66)= 5.79, p = <.001. Clinician type (psychiatrist or paediatrician/child neurologist) was related to the *rule based approaches*, *tolerance of side effects*, and *long term use of medication* subscales. Paediatricians reported using a more systematic and rule based approach t(66)= -2.48, p = .016 relative to their psychiatric colleagues. Psychiatrists were found to be more tolerant of side effects t(66)= -2.51, p =.015 and prefer longer term courses of medication t(66)=2.60, p =.011. Finally, a positive

correlation was found between the *focus on symptoms* subscale and the total length of times clinicians were in medical practice (r = .34, p = .012), showing that less experienced and younger clinicians are likely to be more interested in improving functioning compared to their more experienced peers.

Preliminary classification of clinicians into different clusters. K-means cluster solutions with two to five cluster factors were analysed and visually inspected to determine the best fit model which included roughly equal numbers of participants in each group and fit with hypotheses that there may be separate groups of clinicians who showed clear preferences for medication or psychosocial treatments for ADHD. The best fit model for the current data included four clusters with roughly equal numbers of participants in each group. An ANOVA determined that a significant interaction exists between the four cluster groups and mean IPAQ subscale scores $F(21, 448) = 11.06$, $p < 0.001$. Post hoc tests using the Bonferroni correction revealed significant differences between the four cluster groups and scores on the eight IPAQ subscales. These difference scores and significance levels are summarised in Table 4.

Figure 1 about here

Cluster 1 (n=15), reported being least tolerant of the putative side effects of medication, placed the most importance on the child's views, and were the most supportive of psychosocial interventions. Because of this profile we labelled this group *pro psychosocial*. The second cluster (n=18) focused more on treating ADHD symptoms and were most positive about longer term medication hence we labelled this group *medication focused.* They were also most tolerant about side effects. Cluster 3 (n=15), which we labelled *unsystematic*, was distinguished from the other three clusters in their reports of using the least systematic approach. Finally, the fourth cluster (n=20; *response optimisers*)

had the highest score on the optimising subscale, and were least influenced by external pressure. Figure 1 illustrates the cluster patterns for each IPAQ subscale.

Table 4 about here

Discussion

We have presented initial data from the IPAQ - describing clinicians' attitudes to prescribing medication for ADHD. All of the subscales were internally consistent and reliable. Overall clinicians had high ratings on the *use of rule based approach, the need to optimize outcomes, the importance of taking the child's views into account when making decisions* and the *value of psychosocial interventions* subscales. Interestingly, the first three of these themes were remarkably absent from clinician's accounts drawn from the previous open-ended interviews in the DRAMa study [27]. It is therefore still unclear as to whether clinicians truly ascribe value to a child-centered, guideline-based approach, which focuses on systematic practice and multiple steps in treatment to achieve the most favourable outcome for the child as possible. Alternatively, these types of questions may be susceptible to social desirability effects reflecting a discrepancy between what they report as being important and the values that they actually are applying to their clinical practice. The high overall ratings on the *rule based approach* subscale suggest that clinicians in this sample, regardless of country of practice or professional affiliation (psychiatry or paediatrics/child neurology), believed that their medication-related decisions are currently informed by best practice, published guidelines [12, 14, 26]. The lowest mean scores were given to the *focus on symptoms* subscale, reflecting practice that is also in line with guidelines; clinicians are advised to assign greater weight to the broader impact of ADHD on the child's functioning and levels of impairment, rather than applying standard symptom

counts to determine the effectiveness of a treatment. This accords with the growing focus on impairment as an outcome in clinical trials. Accordingly, clinicians in this study expressed views in line with current recommendations. Clinicians, however, were quite apprehensive about side effects and appeared uncertain about the value of long-term medication treatment and disinclined to pursue it. Thus, more studies about side effects of ADHD medication treatment, and the risk/benefit ratio, both in the short and longer term are required to inform clinicians view as current approaches may be too over-cautious.

The intercorrelations between the IPAQ subscales suggested that the more clinicians gave importance to guidelines and a rule based approach, the more they were likely to have a positive view of psychosocial treatments, a higher sensitivity to side effects and reported feeling less influenced by external pressure. The more clinicians held a symptom-based approach, the less importance they were likely to place on psychosocial treatments. Psychosocial treatments were also of low importance to those who regarded long term medication treatment as favourable.

Based on these patterns of association we identified four clinician profiles which we labeled as (i) pro-psychosocial, (ii) medication focused, (iii) unsystematic, and (iv) response optimisers. Remarkably, the first two clusters both assigned high ratings to guideline and rule-based approaches, but nevertheless showed a large discrepancy in their treatment preferences: Whereas roughly a quarter of the participants (cluster 1) showed a clear preference for the use of psychosocial interventions, an equivalent proportion of clinicians (cluster 2) were distinctly medication oriented. Moreover, no relationship was found between country of practice and preference for medication or psychosocial inteventions suggesting this was not driven by differing guidelines, which may be more or less prevalent between

the UK and Europe. Either these two groups of professionals differentially interpreted the available guidelines, highlighting that published guidelines are not providing clear and straightforward direction for clinicians, or there is controversy amongst different available clinical guidelines, leaving room for individual interpretations and preferences. In practice, this may lead to individual patients receiving very different advice and recommendations based solely on inter-individual variation in treatment preferences of clinicians. Currently, the American Academy of Child and Adolescent Psychiatry practice parameter [16] and the European (Eunethydis network) guidelines [14, 28] consider both medication or psychosocial treatment as a first choice for mild to moderate cases and medication as a necessary first choice in severe cases. Conversely, the NICE guidelines [12] advocate that psychosocial treatment is always offered first in mild to moderate cases and that medication is only to be initiated when this fails or in the most severe (i.e. hyperkinetic disorder) cases. Accordingly, even when based on the same available empirical evidence, guideline producing committees do not always agree and therefore quite different attitudes in practice can be observed, all equally supported by evidence based medicine.

The pro-psychosocial cluster also clearly expressed a child-centered approach, with greater focus on the child's views and involvement of the child in designing treatment plans, as well as a high sensitivity to side effects. This child-centered approach seems logical for those clinicians who favor psychosocial treatments, but may be equally important to consider for those favoring medication treatment, especially in the long term. Day-to-day adherence and long term persistence to a medication regimen have been shown to be relatively poor in ADHD treatment. Even in a well-managed trial, such as the Multimodal Treatment of Attention Deficit Hyperactivity Disorder (MTA) study, 25% of children who gave verbal reports of

medication adherence were found without any trace of medication in their saliva samples when tested [33]. The authors reported that, particularly from the age of 12 years onwards, adherence to medication drops drastically with increasing age. Adolescents said they were less adherent because they felt fewer physical advantages of medication. They also reported more autonomy and responsibility for their medication schedule and therefore forgetfulness became more of an issue. Moreover, adolescents suffered more subjective side-effects of medication and were more fearful about brain effects, particularly in light of the incompatibility of their medication with alcohol and drugs [34]. Thus, it seems to be of great importance to build up a strong therapeutic relationship with the patient from an early age and repeatedly supply psycho-education at an age-adapted level, in order to further and fully engage the adolescents in continued treatment. Developing such relationships may mitigate against some of the poor outcomes reported for older adolescents and adults with ADHD [5].

The second group of clinicians in this study was characterized as medication focused. They reported the highest scores on the *focus on symptoms* subscale, reflecting treatment decisions that target symptom expression and causes rather than aiming to improve the child's overall level of impairment or quality of life, as well as preferences for longer term courses of medication. Evidence for positive short term effects of stimulant medication for children with ADHD is consistently seen in clinical trials [35]. However, the empirical literature on the safety and long term effects of stimulant use is limited. A recent 10-year longitudinal study on 112 children with ADHD has reported compelling evidence for the long term use in the reduction of psychiatric impact of the condition [20]. Specifically, 73% of the group was in receipt of life-long courses of stimulants, and those taking the medication were

significantly less likely to develop major depression, conduct disorder, anxiety, and oppositional-defiant disorder. They were also less likely to repeat a year in school. In terms of academic achievement, several studies have shown a positive relationship between duration of treatment and academic outcome [36-38]. Conversely, other reports have suggested that the dopaminergic effects of stimulants may alter the structure and function of the brain [39, 40], and the long-term effects of this are unknown. Given this uncertainty it is quite understandable that clinicians have different attitudes to long-term use.

A third group of clinicians were differentiated as 'unsystematic' by reporting medication related decisions that were least in line with clinical guidelines and evidence based practice. Guidelines strongly recommend that the treatment for ADHD must be based on an extensive diagnostic evaluation, i.e. the clinician should only start ADHD-treatment when the child meets the diagnostic criteria for ADHD [26]. Furthermore, when prescribing, contra-indications and dose-schedules should be carefully monitored and followed. Clinicians in this group had the lowest scores on the *rule based approach* subscale. There were no other clear and consistent patterns of responses on any of the other subscales

The final and largest group of clinicians in this study was characterised by the highest scores on the *attitudes to optimising* subscale, demonstrating that their treatment goals revolve around the greatest level of symptom reduction and functioning improvement as possible. Guidelines usually promote an active role for the clinician to strive for a systematic titration approach in which all possible doses are tried in order to evaluate the optimal outcome for the patient [14]. The level of active engagement required to ensure optimised outcomes may not always be possible, given the constraints and limitations of time and resources in everyday clinical

practice, as well as the need to ration service delivery and balance clinical priorities. Because of this, a balancing of costs of treatment (to the clinician and the state) and benefits to the patients and their family/community is necessary. Moreover, clinicians may aim towards achieving "good enough" treatment, rather than optimal treatment, as long as patients (and their parents and teachers) are not actively in disagreement with the treatment plan, and in order to avoid using medication as a means to strive for perfection or 'super normalization'. Accordingly, this group was also least likely to allow external sources of pressure, including teachers and parents, influence or alter their treatment decisions.

Limitations

The IPAQ was a reliable and informative measure of clinicians' prescription treatment attitudes for children with ADHD. However, the study is not without its limitations. The construction of the IPAQ was based on themes derived from a qualitative interview study conducted with many of the same clinicians who completed the questionnaire. Thus, the extent to which the IPAQ is generalisable to the views and attitudes of a wider population of prescribing clinicians remains unknown and requires replication with an independent group of participants. The validity of the questionnaire must also be established to clarify whether socially desirable responses were provided by respondents as seen through the discrepancies in responses given to the IPAQ rating scale in the current study versus the open-ended interview format used in Kovshoff et al [27]. Additionally, the small sample size warrants caution when interpreting the findings. In particular a larger sample is needed to confirm the psychometric integrity of the subscales and to study other elements of reliability and validity.

Conclusions

Pharmacological treatment of ADHD is common medical practice, but at present a wide variability in treatment practices is seen amongst individual clinicians. Thus, greater knowledge and awareness of the beliefs, views, and attitudes which govern these practices is warranted in order to understand this variability and reduce it in a direction that is compatible with evidence-based knowledge. The current data provide initial evidence about the factors that influence clinical decision making in this regard highlighting the considerable heterogeneity in approaches to medication in the sample studied. If the current results were replicated in a larger study they would be useful in both clinical training and the development of implementable guidelines.

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Table 1 List of Items for Each IPAQ Subscale

Subscale Name	Items
Optimising Outcomes	My aim in treatment is to fully normalise ADHD behaviour.
	Not all symptoms necessarily have to disappear before I stabilize treatment.*
	I increase the dose of medication for ultimate improvement.
	I am only satisfied with treatment if symptoms are controlled across the whole day
	I am not satisfied with treatment unless all symptoms have improved.
Rule-based approach	It's important that a patient has a formal diagnosis before starting medication.
	I carefully check for contra-indications before prescribing.
	I always carefully follow clinical guidelines when using medication.
	It is vital that parents follow the dose schedule precisely.
	I am happy to try medication even when uncertain about the diagnosis.*
Tolerance of side effects	Treatment should be withdrawn if side effects emerge.*
	The emergence of common side effects does not alter my treatment plan.
	Concern about serious and uncommon side effects influences my prescribing practice.*
	Serious side effects are so rare that they are not an issue for me.
	I am concerned when any side effects of medication emerge.*
Focus on symptoms	Treating daily functioning is less important than treating ADHD.
	My goal is to reduce problems in daily living rather than normalise ADHD.*
	Improvement in a patient's quality of life is the most important thing.*
	I am more likely to prescribe if I suspect that the ADHD has a biological cause.*
	My view of the cause of the ADHD in a patient does not influence my choice of treatment.

Influenced by external pressure	Parents' wishes influence my decisions to medicate .
	It's often hard to resist parental pressure to prescribe.
	If parents disagree with my decision to prescribe I will try hard to persuade them.*
	Teachers' wishes influence my decision to medicate.
	I give my advice strongly when discussing medication with parents.*
Importance of child's views	The child's view about the need for medication is more important than the parents
	Children's views influence my decision whether to medicate.
	Children's views about medication are of little value.*
	I will use medication even if the child thinks he/she does not need it.*
	The adult's view about medication overrides that of the child.*
Long term meds	The longer you can medicate a patient with ADHD the better.
	Long term medication should be avoided where possible.*
	I try to stop treating with medication as soon as possible.*
	I try to minimize long term exposure to medication.*
	I try to stop treating with medication as soon as the child reaches a certain age.*
Positive views of psychosocial interventions	Medication is the only really effective treatment for ADHD.*
	Psycho-social treatments should be used first before medication.
	The effectiveness of psycho-social treatments is often underestimated.
	I only use medication if psycho-social treatment has failed.
	I always want families to agree to psycho-social treatments alongside medication.

Note. * indicates that the item must be reversed scored.

Table 2 Reliability of IPAQ Subscales

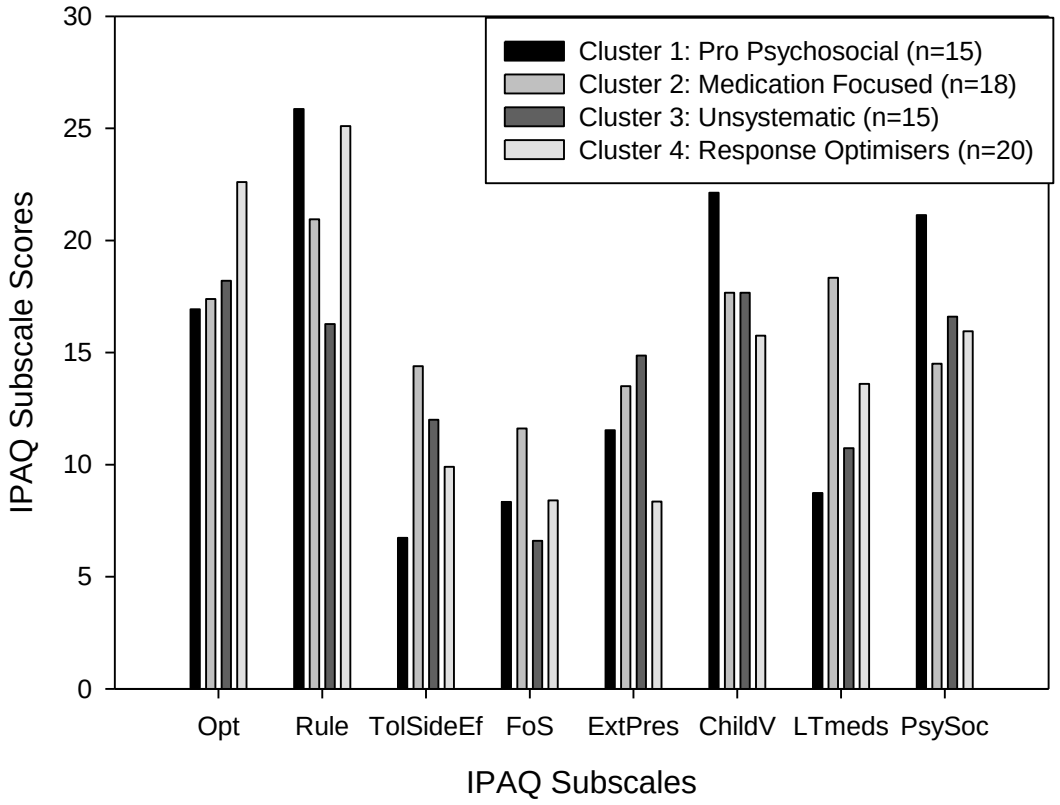
	N	Alpha Coefficient
Optimising Outcome	68	.72
Rule-based approach	68	.75
Tolerance of side effects	68	.63
Focus on symptoms	68	.69
Influenced by external pressure	68	.62
Importance of child's views	68	.78
Long term meds	68	.63
Positive views of psychosocial interventions	68	.73

Note. Alpha coefficients for the individual IPAQ Subscales

Table 3 IPAQ Subscale Scores for the Sample

Subscale Name	N	Mean (SD)	Median	Range
Optimising Outcomes	68	19.00 (4.73)	18.80	9 – 28
Rule-based Approach	68	22.22 (4.82)	22.75	7 – 30
Tolerance of Side Effects	68	10.85 (4.82)	11.25	0 – 21
Focus on Symptoms	68	8.84 (4.11)	8.69	1 – 19
Influenced by External Pressure	68	11.85 (4.75)	12.38	2 – 21
Importance of Child's Views	68	18.09 (4.87)	18.00	3 – 27
Long Term Medication	68	13.15 (5.15)	12.67	2 – 24
Psychosocial Interventions	68	16.85 (5.36)	16.85	4 – 30

Figure 1: Cluster Group Patterns on Each of the Eight IPAQ Subscales



Note. Figure 1 shows the findings from a cluster analysis of participant responses to questionnaire. Opt = Optimising Outcomes; Rule = Rule based approach; TolSideEf = Tolerance of side effects; FoS = Focus on Symptoms; ExtPres = Influenced by external pressure; ChildV = Importance of child's views; LT meds = Long term medication; PsySoc = Psychosocial interventions.

Table 4 Significant Cluster Group Differences on IPAQ Subscales

IPAQ Subscales	F	*p*	Cluster Significantly higher or lower than			
Optimising	7.22	*p*<.001	Cluster 4 >	Cluster 1	Cluster 2	Cluster 3
Systematic Approach	31.20	*p*<.001	Cluster 3 <	Cluster 1	Cluster 2	Cluster 4
Tolerance of Side Effects	10.65	*p*<.001	Cluster 1 <	Cluster 2	Cluster 3	
Focus on Symptoms	5.19	*p*=.003	Cluster 2 >	Cluster 3		
Influenced by External Pressure	8.51	*p*<.001	Cluster 4 <	Cluster 2	Cluster 3	
Importance of Child's Views	6.27	*p* =.001	Cluster 1 >	Cluster 2	Cluster 3	Cluster 4
Long Term Medication	20.42	*p*<.001	Cluster 2 >	Cluster 1	Cluster 3	Cluster 4
Psychosocial Interventions	5.46	*p* = .002	Cluster 1 >	Cluster 2	Cluster 4	

Note. F and p values in table refer to analyses of variance (ANOVA) that compared cluster group scores and IPAQ subscale scores.